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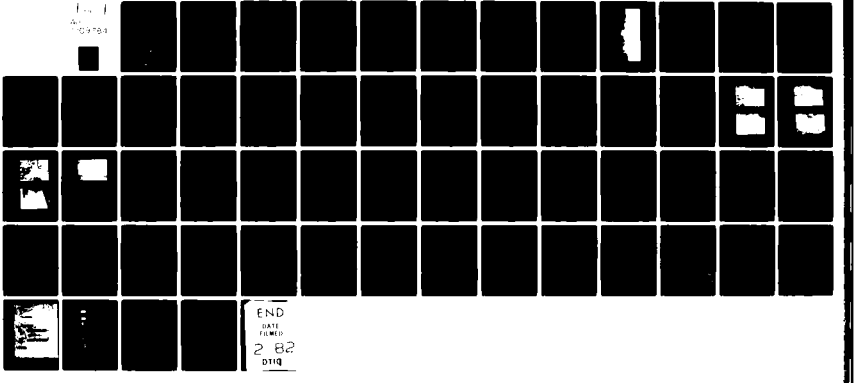

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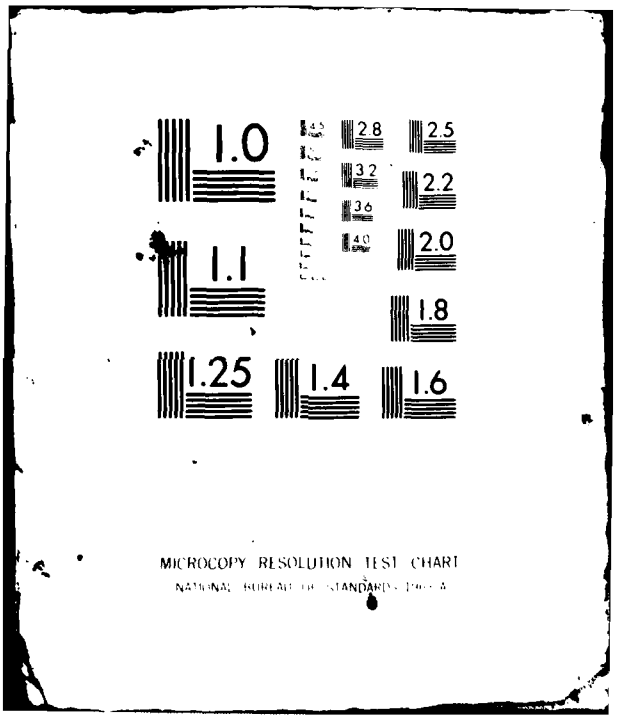
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LEVEL II

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OSWEGO RIVER BASIN

JENNINGS POND DAM

TOMPKINS COUNTY, NEW YORK

INVENTORY NO. N.Y. 944

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PREPARED FOR

NEW YORK DISTRICT CORPS OF ENGINEERS

JULY 1981

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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Tompkins County

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Evaluation of existing conditions did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam was found to have some deficiencies which require further evaluation and implementation of remedial measures.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using the Corps of Engineers' criteria for initial review of spillway adequacy, it was found that the dam would be overtopped by storms less than five percent of the Probable Maximum Flood (PMF). Because spillway capacity is less than 50 percent of the PMF and failure of the dam would increase the hazard to downstream residents, the spillway capacity is considered to be seriously inadequate and the dam is assessed as unsafe/nonemergency.

Classifying a dam as unsafe because of a seriously inadequate spillway does not connote the same degree of emergency as would be associated with an unsafe classification due to a structural deficiency. It means that spillway capacity appears to be seriously deficient; and if a severe storm were to occur, overtopping and failure of the dam could result, significantly increasing the loss of property downstream of the dam.

The downstream face of the dam is steep and covered with large trees and brush. The crest of the dam is irregular. Crest level ranges from 0.6 foot to 2 feet above normal pool level. Seepage and swampy conditions exist along the toe of the dam. The embankment is in need of general repair and restoration. Flattening of the downstream slope and installation of toe drains should be considered.

PREFACE

This report is prepared under the guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
JENNINGS POND DAM
N.Y. 944
DEC I.D. NO. 75C-768
OSWEGO RIVER BASIN
TOMPKINS COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Jennings Pond Dam N.Y. 944
State Located:	New York
County Located:	Tompkins
Stream:	Buttermilk Creek (a stream flowing into Cayuga Lake Inlet)
Date of Inspection:	March 26, 1981 and June 3, 1981

ASSESSMENT

Evaluation of existing conditions did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam was found to have some deficiencies which require further evaluation and implementation of remedial measures.

Using the Corps of Engineers' criteria for initial review of spillway adequacy, it was found that the dam would be overtopped by storms less than five percent of the Probable Maximum Flood (PMF). Because spillway capacity is less than 50 percent of the PMF and failure of the dam would increase the hazard to downstream residents, the spillway capacity is considered to be seriously inadequate and the dam is assessed as unsafe/nonemergency.

Classifying a dam as unsafe because of a seriously inadequate spillway does not connote the same degree of emergency as would be associated with an unsafe classification due to a structural deficiency. It means that spillway capacity appears to be seriously deficient; and if a severe storm were to occur, overtopping and failure of the dam could result, significantly increasing the loss of property downstream of the dam.

The downstream face of the dam is steep and covered with large trees and brush. The crest of the dam is irregular. Crest level ranges from 0.6 foot to 2 feet above normal pool level. Seepage and swampy conditions exist along the toe of the dam. The embankment is in need of general repair and restoration. Flattening of the downstream slope and installation of toe drains should be considered.

It is recommended that further investigations should commence within three months of the date of notification of the owner. Measures deemed necessary as a result of these investigations and other work recommended in this report should be completed within 18 months from issuance of this report.

Assessment - Jennings Pond Dam

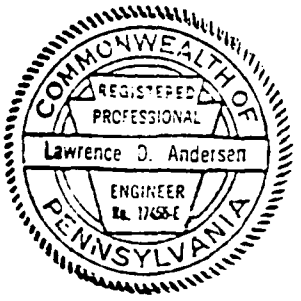
1. A further investigation should be undertaken by a professional engineer to more accurately determine the spillway capacity and the nature and extent of improvements required to provide adequate spillway capacity.

2. The trees on the downstream face of the dam should be removed under the supervision of a professional engineer. In conjunction with this work, an investigation into improving the stability of the embankment and controlling seepage should be undertaken. This may include measures such as flattening of the downstream slope and installation of a toe drainage system (for controlling seepage and wet conditions along the toe of the dam).

3. Deteriorating concrete in the spillway structure should be repaired.

4. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of emergencies.

5. The dam and appurtenant structures should be inspected regularly and necessary maintenance should be performed.



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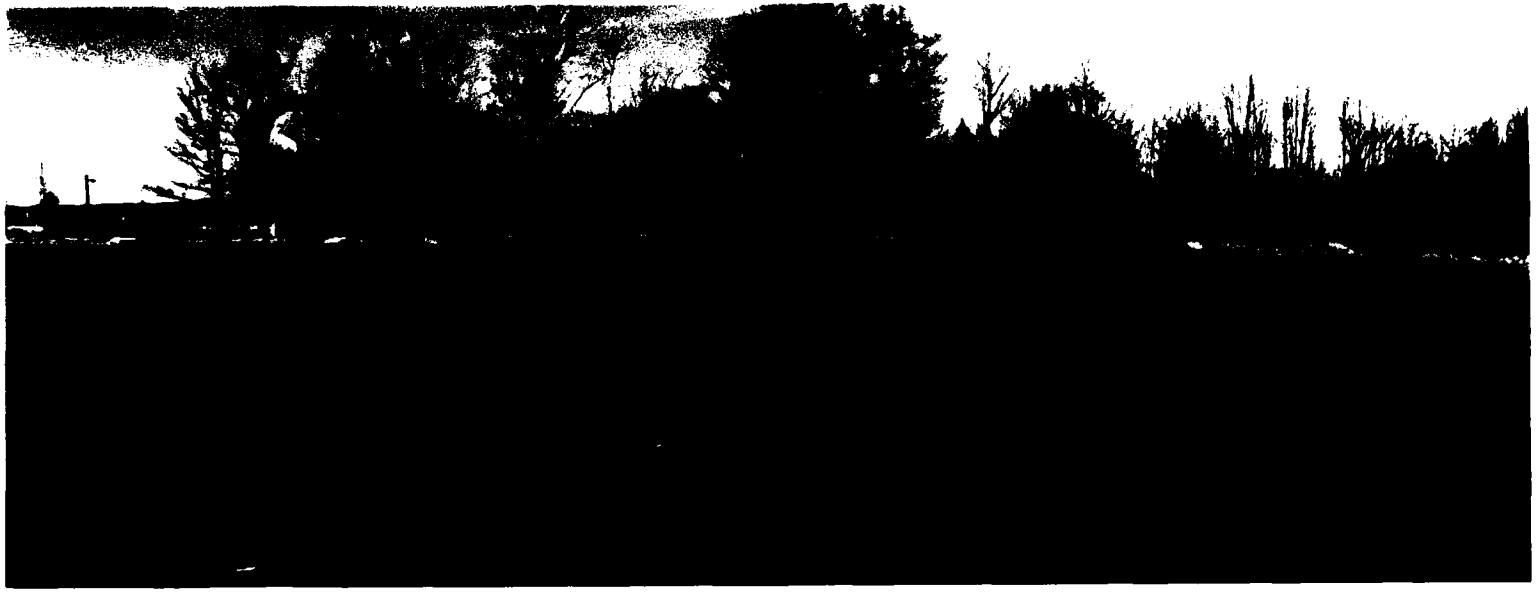
Vice President
D'Appolonia Consulting Engineers, Inc.
Pittsburgh, Pennsylvania

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 14 Aug 81

JENNINGS POND DAM
N.Y. 944
DEC I.D. 75C-768
MARCH 26, 1981



OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
JENNINGS POND DAM
N.Y. 944
DEC I.D. NO. 75C-768
OSWEGO RIVER BASIN
TOMPKINS COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

The inspection was to evaluate the existing conditions of the subject dam, to identify deficiencies and hazardous conditions, to determine if they constitute hazards to life and property, and to recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Dam and Appurtenances

The Jennings Pond Dam is an earth embankment with a maximum height of 15 feet from the downstream toe with a crest width ranging from six to eight feet. The embankment gradually merges into the abutments, and the limits of the embankment are not well defined. The length of the dam appears to be about 150 feet. The downstream face is covered with brush and trees and has a slope ranging between 1.5:1 (horizontal to vertical) and 1:1.

There are no design or construction drawings available for the dam. A field sketch (Plate 2) illustrates the main features of the dam. As shown on Plate 2, a unique feature of the dam is that a dike exists through the reservoir, extending from an area on the left shoreline of the reservoir (looking downstream) to the right abutment of the dam. The dike forms a pool between the dike and the embankment with a surface area of about one acre. The crest of the dike is generally below the dam crest level. It is reported that a six-foot-diameter corrugated metal pipe beneath the dike maintains flow from the main lake to the pond formed by this dike.

The spillway facilities for the dam consist of a concrete structure near the left abutment. The spillway structure is a rectangular channel approximately six feet wide and nine feet deep. The upstream

end of the structure is equipped with flashboards which control the pool level. On the dates of inspection, the top of the flashboards were seven feet above the base of the spillway channel and six feet above the sill at the base of the flashboards. The lake can be lowered by approximately six feet from the present normal pool level by the removal of the flashboards. The dam has no other outlet facilities.

b. Location

The dam is located near the headwaters of Buttermilk Creek in Buttermilk Falls State Park, approximately one-half mile southwest of Danby in Thompkins County, New York. Plate 1 illustrates the location of the dam.

c. Size Classification

Based on the height of the dam (15 feet), the dam is classified to be a small dam.

d. Hazard Classification

The dam is classified to be in the high hazard category. Buttermilk Creek flows through the community of Danby, approximately one-half mile downstream from the dam. At least two houses and one commercial garage are considered to be in the potential floodplain of Buttermilk Creek. It is estimated that failure of the dam would cause loss of more than a few lives and significant property damage in this area.

e. Ownership

The dam is owned by the State of New York and operated by the Finger Lake State Parks and Recreation Commission, R.D. 3, Trumansburg, New York 14886, (607) 387-7041. Attention: Mr. Jessie Miller, Senior Engineer.

f. Purpose of Dam

The lake impounded by the dam is used for recreation.

g. Design and Construction History

The date of construction of the dam is unknown. A state report, dated January 1925, indicates the dam to be an old sawmill dam, probably built in the late 1800's. A design sketch provided by State Park personnel indicates that the existing spillway was constructed in 1927. The 1927 sketch was too poor for reproduction; therefore, it is not included in this report.

h. Normal Operating Procedure

The reservoir is normally maintained at the crest level of the spillway flashboards. The pool level can be lowered by approximately six feet with the removal of the flashboards.

1.3 PERTINENT DATA

Elevations referred to in this section and subsequent sections of the report were calculated based on field measurements assuming the normal pool level on the date of inspection to be at Elevation 1278 (USGS Datum), which is shown to be the norman pool level for Jennings Pond on USGS 7.5-minute Willseyville quadrangle.

a. Drainage Area (sq. mi.)	1.14[1]
b. Discharge at Dam Site (cfs)	
Principal spillway at top of dam (with flashboards)	10
Principal spillway at top of dam (without flashboards)	350
Total spillway capacity at top of dam (existing condition)	10
c. Elevation (USGS Datum) (feet)	
Top of dam	1278.6
Principal spillway crest (without flashboards)	1272.0
Principal spillway crest (with flashboards)	1278.0
d. Reservoir (acres)	
Surface area at top of dam	35
Surface area at crest of principal spillway	31
e. Storage Capacity (acre-feet)	
Top of dam	160
Principal spillway crest	180±
f. Dam	
Type	Earth embankment
Length	150± feet
Height	15 feet
Top width	Variable: 6 to 8 feet
Side slopes	Downstream: 1.5H:1V to 1H:1V Upstream: approximately 1H:1V
Zoning	Unknown
Impervious core	Unknown
Cutoff	Unknown
Grout curtain	Unknown

[1] Planimetered from USGS topographic map. State records indicate the drainage area to be 1.6 square miles.

g. Primary Spillway

Type	Overflow section equipped with flashboards
Length	6 feet, 6 inches
Crest elevation (top of flashboards)	1278.0

h. Emergency Spillway

The dam has no formal emergency spillway.

i. Reservoir Drain

The reservoir can be drawn down approximately six feet by the removal of the primary spillway flashboards. The dam has no other drain facility.

j. Appurtentant Structures

A dike exists through the reservoir extending from an area on the left shoreline (looking downstream) to the right abutment of the dam. The dike has a crest width of about eight feet. The crest of the dike is generally below the dam crest level. A pipe through the dike maintains flow from the lake to the pond formed by this dike.

SECTION 2: ENGINEERING DATA

2.1 DATA AVAILABLE

Available information was obtained from New York State Department of Environmental Conservation, Dam Safety Division files and from Finger Lake State Parks Commission personnel. Available information includes a dam inspection report dated 1925 and a spillway design drawing dated 1927.

2.2 GEOLOGY

The Jennings Pond Dam is located in the glaciated Allegheny Plateau section of the Appalachian Plateau Province. This region is characterized as a maturely dissected plateau with the topographic features modified by continental glaciation. The modification consists of rounding off of the high areas and deposition of glacial till in the valleys.

The dam site is located south of a large northeast trending anticline (trending approximately north 70 degrees east). The folding is gentle with a maximum dip of the limbs of one to two degrees. The dip of the strata is affected locally by the folding; however, regionally, the rock strata dip south to southwest at approximately 100 to 150 feet per mile. The most prominent fracture orientations in the region have a strike of north 20 degrees west and a vertical dip. A secondary fracture trend strikes north 65 degrees east and is vertical, and less prominent fractures strike north 80 degrees west and north 15 degrees east and are vertical. A prominent north 10 degrees east linear trends through the dam.

The rock strata in the area consist of unconsolidated Pleistocene glacial till (Wisconsin Drift) underlain by strata of the Lower West Falls Group (Upper Devonian Age). The glacial till consists of a mixture of clay and silt with varying quantities of gravel. The glacial till is relatively thin on hilltops and slopes and thicker in the valleys. The bedrock consists of a thick sequence of interbedded very dark gray to black shale and siltstone, which may be up to 2,000 feet thick. The rock strata below the West Falls Group is the Sonyea Group, consisting of interbedded gray calcareous shale, gray and greenish-gray siltstone and silty shale, and fissile black shale.

The abutment slopes are relatively gentle and not susceptible to landslide slope movement.

2.3 SUBSURFACE INVESTIGATION

The available information includes no reference to a subsurface investigation. Because the dam is an old sawmill dam, it does not appear likely that any subsurface investigation was conducted in conjunction with the construction of the dam.

2.4 EMBANKMENT AND APPURTENANT STRUCTURES

There is no information available on the design and construction of the embankment. A design drawing, dated 1927, shows the plan and typical cross section of the spillway structure. The spillway structure consists of a rectangular reinforced concrete channel about 6.5 feet wide and 9 feet deep. The 1927 drawing was too poor for reproduction; therefore, it is not included in this report. The upstream end of the channel is equipped with flashboards. No reference was found to indicate whether any hydrology and hydraulic analyses were conducted for sizing the spillway structure.

2.5 CONSTRUCTION RECORDS

No construction records are available. Based on visual observations, the existing spillway structure appears to be in conformance with the 1927 design drawing.

2.6 OPERATING RECORDS

None available.

2.7 EVALUATION OF DATA

Available information includes no quantitative data to assess the geotechnical, structural, and hydraulic features of the dam.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspections of the dam were conducted on March 26 and June 3, 1981. On both dates, the pool level was approximately at the crest level of the spillway flashboards.

b. Embankment

Field observations are illustrated in Plate 2. The downstream face of the dam is steep and covered with large trees and brush. The downstream slope is estimated to be in the range of 1.5H:1V to 1H:1V. A swampy area exists below the downstream toe of the dam; however, no measurable seepage was found to be associated with this area. A seepage point was found at the interface of the embankment and the right wing wall of the spillway structure. The quantity of the seepage is estimated to be in the range of 10 to 20 gallons per minute. The top of the dam was surveyed relative to the spillway flashboard crest elevation and was found to be irregular, ranging from 0.6 foot to 2 feet above pool level. The lowest area is located on the right abutment. A parking area located on the left abutment is also below the average dam crest level by about 0.5 foot.

c. Primary Spillway

The primary spillway structure consists of a concrete channel equipped with flashboards on the upstream end. The flashboards are equipped with eye plates for manually removing the boards. It appears that difficulty may be encountered in removing the boards during high flows through the spillway. Concrete at the junction of the side walls and base slab was found to be deteriorating and in need of repairs.

d. Emergency Spillway

The dam has no formal emergency spillway. However, a low area exists along the right abutment which could function as an emergency spillway. This area is overgrown with large trees and thick brush; therefore, the discharge capacity of this section is uncertain.

e. Reservoir Drain

To the extent that could be determined by visual observation, the dam does not have a reservoir drain pipe. However, the pool level can be lowered approximately six feet from the present pool level by the removal of the flashboards across the spillway channel.

f. Downstream Channel

The downstream channel below the primary spillway discharge structure is the natural stream bed. The channel appears to be stable in the near vicinity of the dam.

g. Reservoir

As illustrated in Plate 2, a unique feature of the reservoir area is the presence of a dike constructed through the reservoir, spanning across the abutments of the dam. According to the State Park personnel, the dike was constructed by end-dumped material. The crest of the dike is approximately 0.6 to 1 foot above the normal pool level.

3.2 EVALUATION

The dam was found to be in poor condition and in need of repair and restoration.

The following conditions were observed, in the order of importance:

1. The downstream face of the dam is irregular and overgrown with large trees. The slope should be restored and the trees removed under the supervision of a professional engineer.

2. Seepage and swampy conditions exist along the downstream toe of the dam. The need for implementing measures to control seepage and swampy conditions should be evaluated.

3. Deteriorating concrete in the spillway structure requires repairs.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The reservoir level is regulated by the spillway flashboards. State Park personnel reported that normally the reservoir is maintained approximately two feet below the top of the spillway walls. It was noted that in the event of a flood threat, flashboards are removed to increase the spillway capacity. No formal operating procedure exists for the dam.

4.2 MAINTENANCE OF THE DAM

The dam is overgrown with large trees and brush. It does not appear that any attempts have been made to maintain the dam.

4.3 WARNING SYSTEM IN EFFECT

No formal warning system exists for the dam.

4.4 EVALUATION

The maintenance condition of the dam is considered to be poor. As noted before, the dam is in need of repair and restoration.

The spillway is equipped with flashboards which can be manually removed. It appears that difficulty may be encountered in removing the flashboards during high flows through the spillway.

SECTION 5: HYDRAULIC/HYDROLOGY

5.1 DRAINAGE AREA CHARACTERISTICS

The Jennings Pond Dam has a watershed of 1.1 square miles. The drainage area is comprised of woodlands. Relief ranges from gentle to steep.

5.2 ANALYSIS CRITERIA

The PMF inflow hydrograph for the reservoir was determined using the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. The data used for the computer input are presented in Appendix D.

5.3 SPILLWAY CAPACITY

The spillway facilities for the dam consist of a six-foot-wide, nine-foot-deep rectangular channel equipped with flashboards on the upstream end. On the dates of inspection, the flashboards were located approximately two feet below the top of the spillway sidewalls. Capacity of the spillway relative to the low spot on the right abutment, which provides a freeboard of about 0.6 foot, is estimated to be about 10 cfs. If all the flashboards were removed, the capacity of the spillway would be approximately 350 cfs.

5.4 RESERVOIR CAPACITY

The storage capacity of the dam at normal pool level (El. 1278) is estimated to be about 160 acre-feet. Surcharge storage between normal pool and the top of the dam is approximately 20 acre-feet.

5.5 FLOODS OF RECORD

No data available.

5.6 OVERTOPPING POTENTIAL

The full PMF and one-half PMF inflow hydrographs were found to have peak flows of 3662 and 1831 cfs, respectively. Various percentages of the PMF inflow hydrograph were routed through the reservoir to determine the percent of PMF inflow that the dam can pass without overtopping the embankment. The computer analyses indicate that the spillway can pass less than five percent of the PMF without overtopping the low area on the right abutment. For one-half PMF, the low area on the right abutment would be overtopped for a duration of 29 hours with a maximum depth of 1.7 feet and most of the main embankment would be overtopped by 0.5 foot. For full PMF, the overtopping duration would be 45 hours with a maximum depth of 2.4 feet. For full PMF and one-half PMF, the peak outflows are

3548 and 1752 cfs, respectively. In this analysis, the low area on the right abutment is assumed to be a broad-crested overflow section. Because of trees and brush in this area, the hydraulic efficiency would likely be reduced. Therefore, actual overtopping of the dam during the passage of 50 percent of the PMF could be more than calculated. It is estimated that due to the poor structural condition of the embankment, overtopping of the dam by about 0.5 foot could initiate breaching of the dam. Because the spillway cannot pass the recommended design flood of one-half PMF without overtopping the dam and visual evaluation of the downstream conditions indicate that failure resulting from overtopping would significantly increase the loss of life and property damage potential, the spillway is classified to be seriously inadequate.

5.7 EVALUATION

The spillway was found to pass less than five percent of the PMF without overtopping the dam and the abutments. Because the spillway capacity is less than one-half PMF and it is estimated that failure of the dam due to overtopping would significantly increase the downstream potential for loss of life, the spillway is considered to be seriously inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

As discussed in Section 3, the downstream face of the dam is steep and covered with large trees and brush. Further, a swampy area and seepage exist along the toe. Considering these conditions, concern exists as to the continued stability of the dam. Rehabilitation of the dam under the supervision of a professional engineer is considered advisable.

b. Design and Construction Data

Available information does not include any design and construction data. In view of the age of the dam (built in the late 1800's), it is not likely that any materials testing or analysis was conducted for the construction of the dam.

c. Postconstruction Changes

None reported.

d. Seismic Stability

The dam is located in Seismic Zone 1. Based on the recommended criteria for evaluation of seismic stability of dams, the structure is presumed to present no hazard from earthquakes.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

In view of the seriously inadequate spillway capacity, the condition of Jennings Pond Dam is considered to be unsafe/nonemergency.

The spillway capacity was evaluated according to the recommended procedure and was found to pass less than five percent of the PMF without overtopping the dam. Because the dam cannot pass one-half PMF without overtopping and it is estimated that a dam failure would significantly increase the loss of life and damage potential downstream, the spillway is classified to be seriously inadequate.

The overall condition of the dam is poor, requiring repairs and restoration. The downstream face of the dam is steep and covered with dense brush and large trees, and the crest of the dam is irregular. The crest level ranges between 0.6 foot to 2 feet above normal pool level. Seepage and wet areas exist along the toe of the dam near the spillway discharge channel wall. The upstream slope shoreline is irregular and lacks erosion protection.

b. Adequacy Information

Available information, in conjunction with visual observations, is considered to be sufficient to make a Phase I evaluation.

c. Need for Additional Investigation

Because the spillway is assessed to be seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the characteristics of the watershed and the nature and extent of improvements required to provide adequate spillway capacity.

Investigation of the seepage and improving the stability of the embankment slope is also required.

d. Urgency

The additional hydrologic and hydraulic investigations of the seepage and improving the stability of the embankment should begin within three months from the date of notification of the owner.

Measures deemed necessary as a result of the investigation should be completed within 18 months of the date of notification.

7.2 RECOMMENDATIONS

1. A further investigation should be undertaken by a professional engineer to more accurately determine the spillway capacity and the nature and extent of improvements required to provide adequate spillway capacity.

2. The trees on the downstream face of the dam should be removed under the supervision of a professional engineer. In conjunction with this work, an investigation into improving the stability of the embankment and controlling seepage should be undertaken. This may include measures such as flattening of the downstream slope and installation of a toe drainage system (for controlling seepage and wet conditions along the toe of the dam).

3. Deteriorating concrete in the spillway structure should be repaired.

4. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of emergencies.

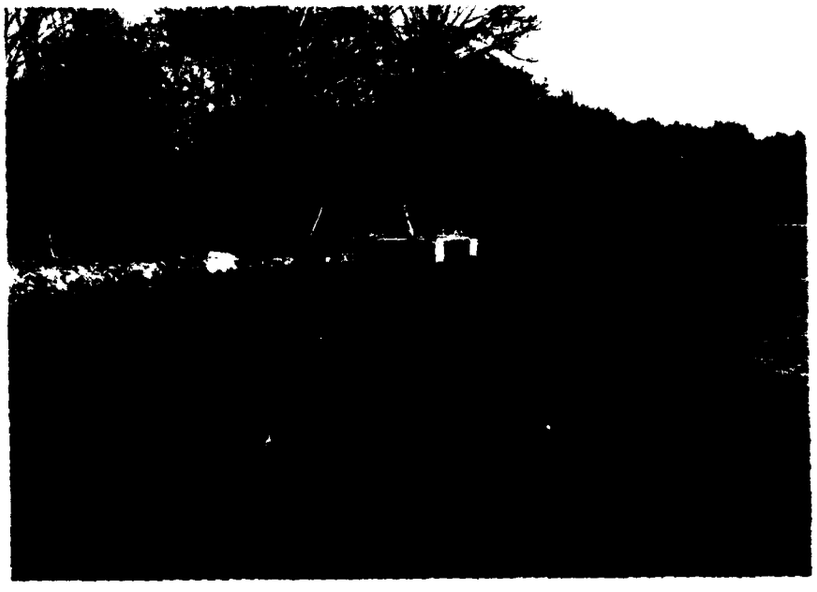
5. The dam and appurtenant structures should be inspected regularly and necessary maintenance should be performed.

APPENDIX A

PHOTOGRAPHS

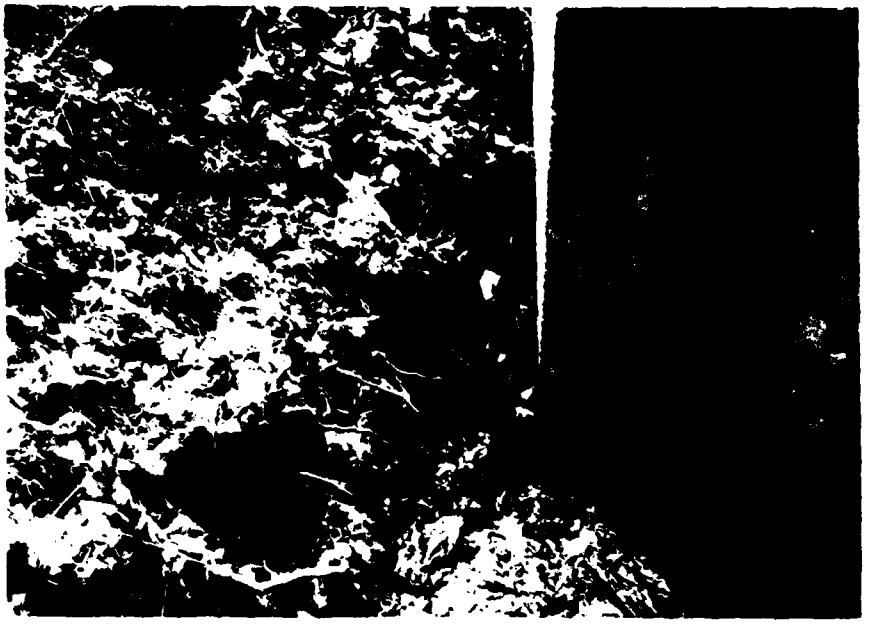
PHOTOGRAPH NO. 1
Dam Crest (note large trees and brush)

PHOTOGRAPH NO. 2
Upstream Slope (looking east)

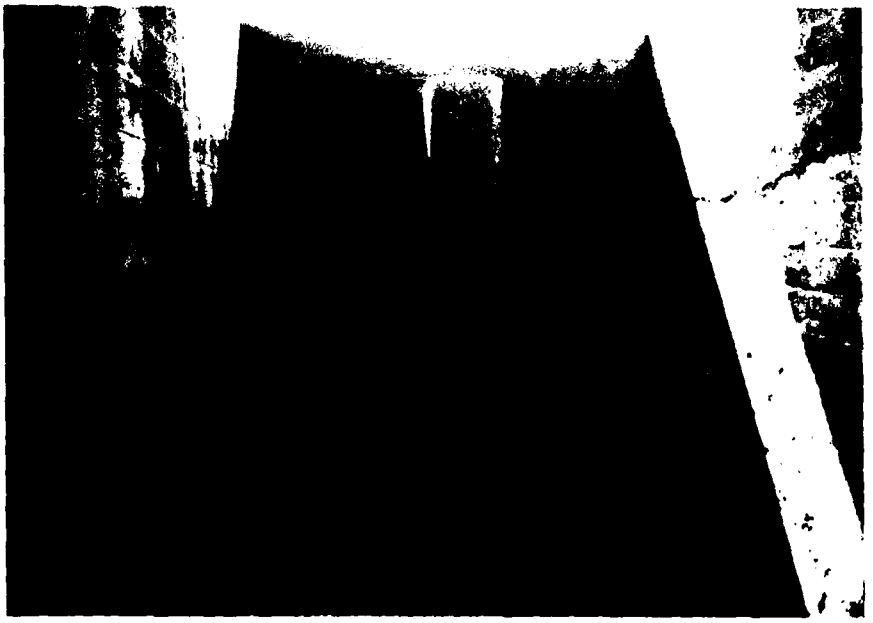


PHOTOGRAPH NO. 3
Spillway and Spillway Approach

PHOTOGRAPH NO. 4
Spillway Discharge Channel



PHOTOGRAPH NO. 5
Seepage at Spillway Wall



PHOTOGRAPH NO. 6
Spillway Crest and Flashboard Looking Upstream

PHOTOGRAPH NO. 7
Downstream Channel at Danby (residential area)

APPENDIX B

VISUAL INSPECTION CHECKLIST

APPENDIX B
VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Jennings Pond Dam

Fed. I.D. # N.Y. 944 DEC Dam No. 75C-768

River Basin Oswago River Basin

Location: Town Danby County Tompkins

Stream Name Buttermilk Creek

Tributary of Cayuga Lake Inlet

Latitude (N) 42° 20.8' Longitude (W) 76° 29.2'

Type of Dam Earth

Hazard Category High hazard

Date(s) of Inspection March 26, 1981 and June 3, 1981

Weather Conditions Sunny, Temp. 50 degrees

Reservoir Level at Time of Inspection El. 1278.0

b. Inspection Personnel Lawrence Andersen, P.E.; James Poellot, P.E.; Bilgin Erel, P.E.; Wah-Tak Chan, P.E.; and Arthur Smith

c. Persons Contacted (Including Address & Phone No.)

Mr. Jessie Miller, Finger Lake State Parks and Recreation Commission, R.D. 3, Trumansburg, N.Y. 14886 (607) 387-7041

d. History:

Date Constructed Before 1925 Date(s) Reconstructed 1927

Designer Unknown

Constructed by Unknown

Owner Finger Lake State Parks and Recreation Commission

2) Embankment

a. Characteristics

(1) Embankment Material Earth

(2) Cutoff Type Unknown

(3) Impervious Core Unknown

(4) Internal Drainage System Unknown

(5) Miscellaneous --

b. Crest

(1) Vertical Alignment Up to 2.4 feet difference between low and high spot of the dam crest.

(2) Horizontal Alignment Embankment gradually merges into both abutments.

(3) Surface Cracks None

(4) Miscellaneous --

c. Upstream Slope

(1) Slope (Estimate) 1H:1V

(2) Undesirable Growth or Debris, Animal Burrows Small brush and trees.

(3) Sloughing, Subsidence or Depressions Shoreline erosion.

(4) Slope Protection None

(5) Surface Cracks or Movement at Toe None

d. Downstream Slope

(1) Slope (Estimate) 1.5H:1V to 1H:1V

(2) Undesirable Growth or Debris, Animal Burrows Covered with large trees and brush.

(3) Sloughing, Subsidence or Depressions Generally irregular, no major signs of distress.

(4) Surface Cracks or Movement at Toe None

(5) Seepage A 10 to 20 gallon per minute seepage at the embankment/spillway junction (see Plate 2 for location).

(6) External Drainage System (Ditches, Trenches, Blanket)

None

(7) Condition Around Outlet Structure See items above.

(8) Seepage Beyond Toe A swampy area (see Plate 2).

e. Abutments - Embankment Contact

No signs of distress.

(1) Erosion at Contact None

(2) Seepage Along Contact None

3) Drainage System

a. Description of System None

b. Condition of System

c. Discharge from Drainage System

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, etc.)

None

5) Reservoir

a. Slopes Gentle slopes, no problems observed.

b. Sedimentation Unknown

c. Unusual Conditions Which Affect Dam See Plate 2 for the dike through the reservoir.

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Community of Danby is located about one-half mile downstream.

b. Seepage, Unusual Growth None

c. Evidence of Movement Beyond Toe of Dam None

d. Condition of Downstream Channel No problem in the vicinity of the dam.

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General Service Spillway: Concrete channel equipped with flashboards on the upstream end.

Auxiliary Spillway: There is no formal emergency spillway. A low area exists along the right abutment and functions as an emergency spillway.

b. Condition of Service Spillway Generally satisfactory. Some concrete deterioration.

c. Condition of Auxiliary Spillway The low area along the right abutment could function as an emergency spillway, but it is overgrown with large trees and thick brush. The discharge capacity of this section is uncertain.

d. Condition of Discharge Conveyance Channel Primary spillway channel is in satisfactory condition.

8) Reservoir Drain/Outlet (The dam has no drain pipe.)

Type: Pipe _____ Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other _____

Size: _____ Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): _____

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): _____

9) Structural

a. Concrete Surfaces Some concrete deterioration at the junction of the walls and base slab of the spillway structure.

b. Structural Cracking Minor cracks in concrete walls.

c. Movement - Horizontal & Vertical Alignment (Settlement)

None

d. Junctions with Abutments or Embankments No problems observed.

e. Drains - Foundation, Joint, Face Unobservable

f. Water Passages, Conduits, Sluices None

g. Seepage or Leakage Seepage at the downstream end of the spillway wall.

h. Joints - Construction, etc. None

i. Foundation Unobservable

j. Abutments Appears to be in good condition.

k. Control Gates None

l. Approach & Outlet Channels Good

m. Energy Dissipators (Plunge Pool, etc.) N/A

n. Intake Structures N/A

o. Stability Good

p. Miscellaneous --

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition N/A

APPENDIX C

ENGINEERING DATA CHECKLIST

APPENDIX C
ENGINEERING DATA CHECKLIST
NAME OF DAM: JENNINGS POND DAM

AREA-CAPACITY DATA:

	Elevation (feet)	Surface Area (acres)	Storage Capacity (acre-feet)
1) Top of Dam (Measured Low Spot)	1278.6	35.5	160(1)
2) Design High Water (Max. Design Pool)			
3) Pool Level with Flashboards	1278.0	31.2	140(1)
4) Service Spillway Crest	1272.0	Unknown	70(1)

DISCHARGES

	Discharge (cfs)
1) Average Daily	2 ±
2) Principal Spillway with Flashboards (Top of Dam)	10
3) Auxiliary Spillway	N/A
4) Total of All Facilities at Maximum High Water	10
5) Maximum Known Flood	Unknown
6) At Time of Inspection	2 ±

(1) Approximate estimates.

DAM: Jennings Pond Dam

CREST ELEVATION: 1278.6

Type: Earth

Width: Variable, 6 to 8 feet Length: 150 feet

Spillover: 6.5-foot-wide concrete overflow equipped with a six-foot-high flashboard.

Location: Near left abutment.

SPILLWAY:

	PRINCIPAL
Elevation	1278 (Top of flashboard) 1272 (Top of spillway crest)
Type	Overflow weir
Width	6.5 feet (weir length)
Type of Control	
Uncontrolled	Uncontrolled
Controlled	
Type (Flashboards; Gate)	Flashboard
Number	--
Size/Length	6.5 feet wide
Invert Material	Concrete
Anticipated Length of Operating Service	--
Chute Length	--
Height Between Spillway Crest and Approach Channel Invert (Weir Flow)	7 ± feet

Hydrometerological Gages:

Type: None

Location: N/A

Records:

Date -

Max. Reading -

FLOODWATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (Mechanisms):

None

DRAINAGE AREA: 1.14 square miles (planimetered from USGS topographic map). State records indicate the drainage area to be 1.6 square miles.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Wood, farm and marsh lands.

Terrain - Relief: Moderate slope.

Surface - Soil: Glacial till (low permeability).

Runoff Potential (existing or planned extensive alterations to existing surface or subsurface conditions)

High runoff potential due to moderate slope and low infiltration rate.

Potential Sedimentation Problem Areas (natural or man-made; present or future)

None observed.

Potential Backwater Problem Areas for Levels at Maximum Storage Capacity Including Surcharge Storage:

None observed.

Dikes - Floodwalls (overflow and nonoverflow) - Low Reaches Along the Reservoir Perimeter:

Location: See Plate 2 for the location of the upstream dike.

Elevation: N/A

Reservoir:

Length at Maximum Pool: 1,800 feet

Length of Shoreline at Spillway Crest: 4,000 feet

APPENDIX D

HYDROLOGY AND HYDRAULIC ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Jennings Pond Dam (NY DEC 75C-768)

PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.5 INCHES 24 HOURS(1)

STATION	1	2	3	4	5
Station Description	Jennings Pond	Jennings Pond *Dam*			
Drainage Area (square miles)	1.14	-			
Cumulative Drainage Area (square miles)	1.14	1.14			
Adjustment of PMF for Drainage Area (%) (1)					
6 Hours	111	-			
12 Hours	123	-			
24 Hours	132	-			
48 Hours	142	-			
72 Hours	-	-			
Snyder Hydrograph Parameters					
t_p (2) (Hours)	1.04	-			
C_p (2)	0.58	-			
L (miles) (3)	1.40	-			
L_{ca} (miles) (3)	0.36	-			
Spillway Data					
Crest Length (ft)	-	6.5			
Freeboard (ft)	-	0.6			
Discharge Coefficient	-	3.2			
Exponent	-	1.5			

(1) Hydrometeorological Report 33 (Figure 1), U.S. Army, Corps of Engineers, 1956.

(2) Snyder's Coefficients (see attached calculations).

(3) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

STORAGE VS. ELEVATION

ELEVATION	ΔH, FEET	AREA (acres) (1)	ΔVOLUME (acre-feet) (2)	STORAGE (acre-feet) (3)
1278.0		31.2		0
	2		76.6	
1280.0		45.9		76.6
	10		675.4	
1290.0		91.8		752.0

(1) Planimetered from USGS maps.

(2) Volume = $\Delta H/3 \cdot (A_1 + A_2 + \sqrt{A_1 A_2})$.

(3) Surcharge storage capacity above top of flashboard Elevation 1278.0.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION   21 APR 80
**********
    1                A1       SNYDER UNIT HYDROGRAPH, SPILLWAY AND DAM OVERTOPPING ANALYSES
    2                A2       JENNINGS POND DAM (NY 75C-768) TOMPKINS COUNTY,N.Y. PROJECT NO. 8C-778-03
    3                A3       FOR 5%,20%,30%,40%,50%,60%,70%,80%,AND 100% PROBABLE MAXIMUM FLOOD(PMF)
    4                D     SCL         0       15        0        0        0        0        0       -4        0
    5                D1       5
    6                D       1         9        7
    7                D1    0.05      0.20     0.30     0.40     0.50     0.60     0.70     0.80     1.00
    8                K       0         1                                           1
    9                K1       CALC. OF SNYDER INFLOW HYDROGRAPH TO JENNINGS POND DAM, (N.Y. 75C-768)
   10                A       1         1     1.14              1.14                                      1
   11                P              21.5      111      123      132      142
   12                T                                                          1.0     0.05             0.0427
   13                M     1.04     0.58
   14                X     -1.5    -0.05      2.0
   15                K       1         2                                           1
   16                K1       ROUTING FLOW THROUGH JENNINGS POND DAM, (NY 75C-768)
   17                Y                                          1        1
   18                Y1      1                                                -1278.0
   19                $A    31.2      45.9     91.8
   20                $E 1278.0   1280.0   1290.0
   21                $$ 1278.0      6.5      3.2      1.5
   22                $D 1278.0     2.65      1.5    715.0
   23                $L    45.0     107.0    157.0    207.0    245.0    270.0    365.0    465.0    565.0    715.0
   24                $V 1278.0   1278.9   1279.0   1279.2   1279.3   1279.4   1279.5   1280.2   1281.0   1281.7
   25                K      99
```

COMPUTER INPUT OVERTOPPING ANALYSIS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .05	RATIO 2 .20	RATIO 3 .30	RATIO 4 .40	RATIO 5 .50	RATIO 6 .60	RATIO 7 .70	RATIO 8 .80	RATIO 9 1.00
HYDROGRAPH AT	1	1.14	1	183.	732.	1099.	1465.	1831.	2197.	2564.	2930.	3662.
	(	2.95)	(	5.19)(	20.74)(	31.11)(	41.48)(	51.85)(	62.22)(	72.59)(	82.96)(	103.70)
ROUTED TO	2	1.14	1	119.	671.	1032.	1392.	1752.	2113.	2473.	2831.	3548.
	(	2.95)	(	3.12)(	18.99)(	29.23)(	39.42)(	49.62)(	59.83)(	70.01)(	80.18)(	100.47)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1278.00	1278.00	1278.60
STORAGE	0.	0.	20.
OUTFLOW	0.	0.	10.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.05	1279.07	.47	57.	110.	13.50	42.25	0.00
.20	1279.72	1.12	64.	671.	21.75	41.00	0.00
.31	1279.95	1.35	74.	1032.	25.25	41.00	0.00
.40	1280.14	1.54	85.	1392.	27.50	41.00	0.00
.50	1280.32	1.72	91.	1752.	29.25	41.00	0.00
.60	1280.47	1.87	99.	2113.	32.50	41.00	0.00
.70	1280.61	2.01	105.	2473.	39.00	41.00	0.00
.80	1280.74	2.14	112.	2831.	43.25	41.00	0.00
1.00	1280.99	2.39	124.	3548.	44.75	41.00	0.00

OVERTOPPING ANALYSIS SUMMARY

D'APPOLONIA
CONSULTING ENGINEERS, INC.

By WTC Date 5/14/81 Subject JENNINGS POND DAM Sheet No. 1 of 1
Chkd. By MS Date 6/8/81 (DEC 75C-768) SNYDER'S COEF. Proj. No. 80-778

SNYDER'S COEFFICIENTS

REFERENCES (1) "HYDROLOGY FOR ENGINEERS" LINSLEY, KOHLER, AND PAULHUS, McGRAW-HILL, 1958. Page 207.
(2) U.S.G.S. TOPOGRAPHIC MAPS "WILLSEYVILLE, N.Y." QUADRANGLE AND "WEST DANBY, NY" QUADRANGLE DATED 1969 SCALE 1"=2000'

FROM REFERENCE (2)

L_{ca} = LENGTH OF WATER COURSE FROM OUTLET TO POINT OPPOSITE THE CENTROID OF D.A.
= 1900 FEET = 0.36 MILES

L = LENGTH OF LONGEST WATER COURSE FROM LAKE TO BASIN DIVIDE
= 7400 FEET = 1.40 miles

H = HEIGHT BETWEEN BASIN DIVIDE LAKE
= EL1550 − EL.1278
= 272

S = SLOPE OF WATER COURSE = $\frac{H}{L} = \frac{272}{7400} = 0.0368$

ACCORDING TO REFERENCE (1) AND THE FIELD OBSERVATIONS JENNINGS POND WATERSHED AREA HAS A $C_p = 0.58$ AND A FOOT HILL DRAINAGE AREA. THUS

$$t_p = 0.72 \left(\frac{L \cdot L_{ca}}{S^{1/2}}\right)^{0.38}$$

$$= 0.72 \left(\frac{1.4 \times 0.36}{\sqrt{0.0368}}\right)^{0.38}$$

$$= 1.04 \text{ Hours}$$

APPENDIX E

PLATES

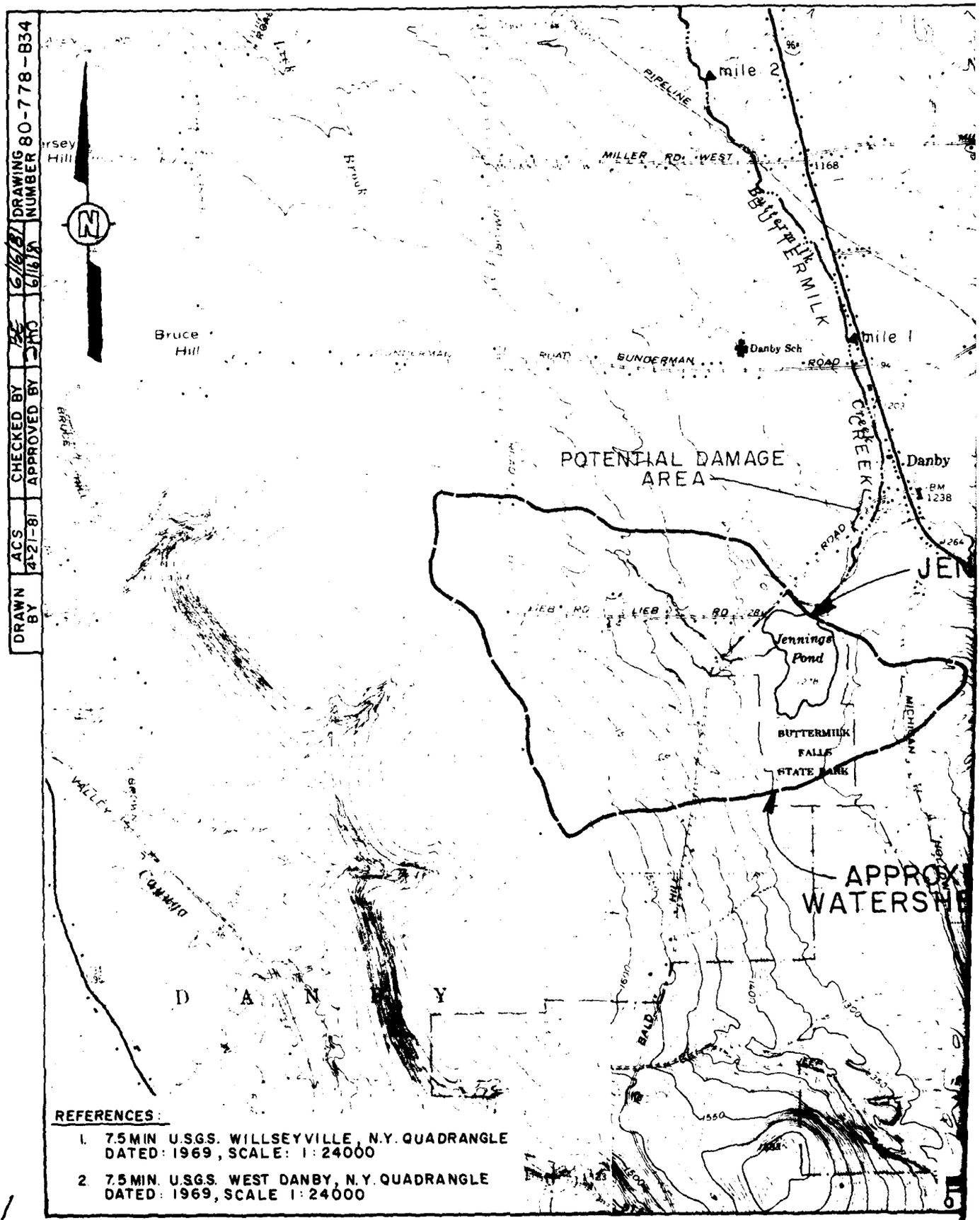


PLATE I

JENNINGS POND DAM
VICINITY FLOOD PLAIN & WATERSHED MAP

DAPTOLONIA

3

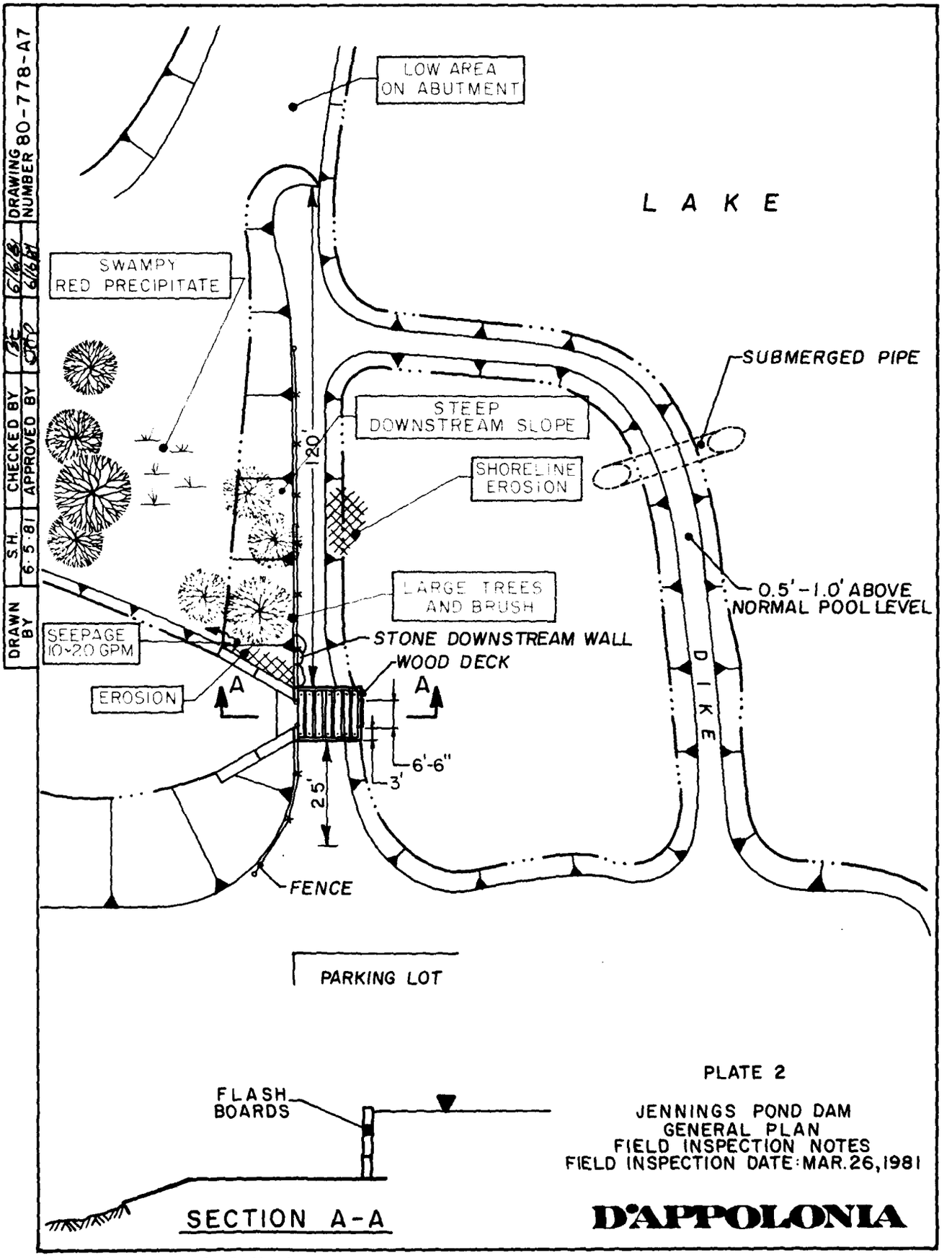


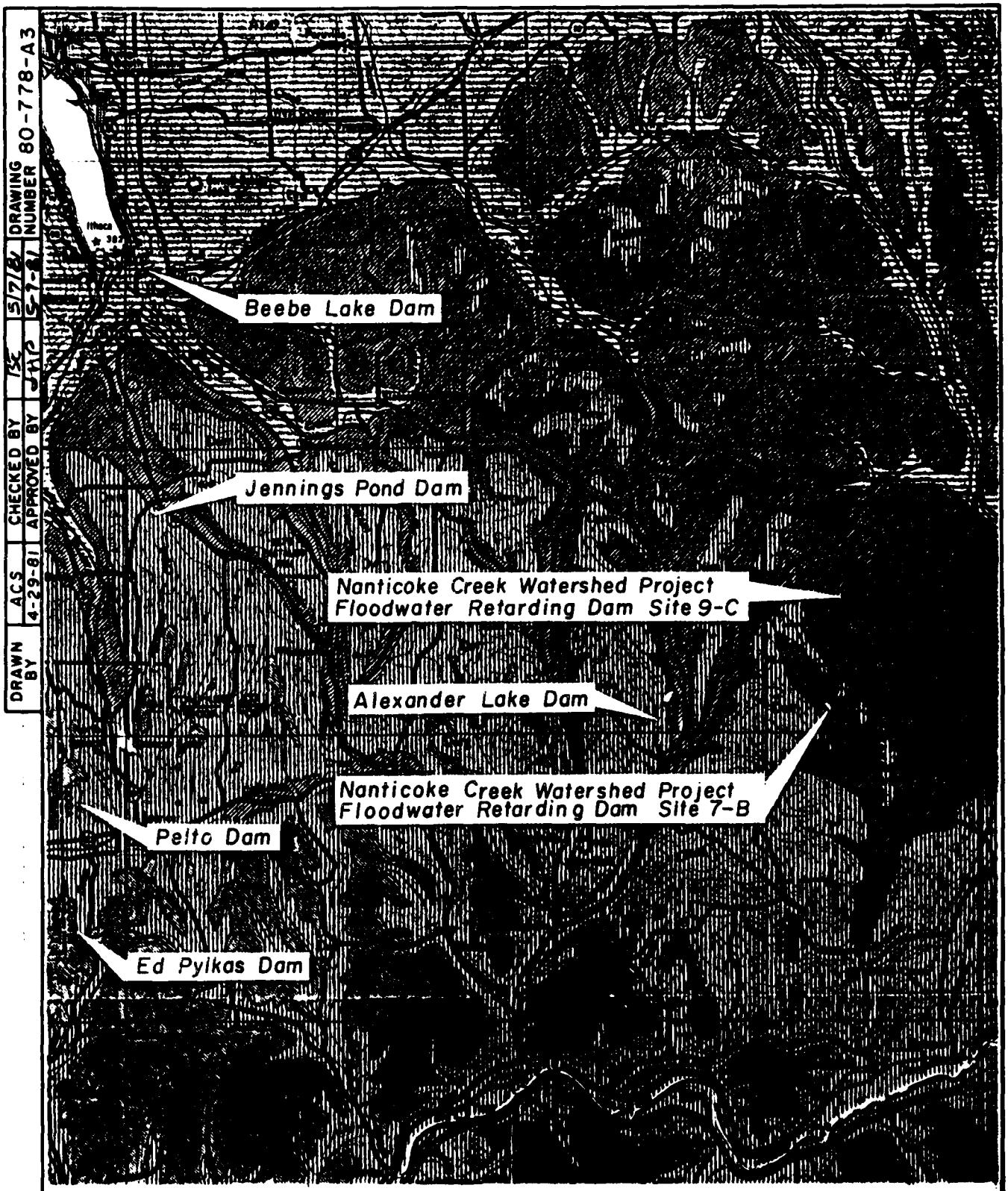
PLATE 2

JENNINGS POND DAM
GENERAL PLAN
FIELD INSPECTION NOTES
FIELD INSPECTION DATE: MAR. 26, 1981

D'APPOLONIA

APPENDIX F

GEOLOGY MAP



DRAWING NUMBER 80-778-A3

DRAWN BY	ACS	4-29-81
CHECKED BY	RC	5/7/81
APPROVED BY	JHC	5-7-81

GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED 1970, SCALE 1:250,000

D'APPOLONIA

DRAWN BY	ACS	CHECKED BY	AE	3/7/81	DRAWING NUMBER 80-778-A6
	4-29-81	APPROVED BY	JHD	5-7-81	

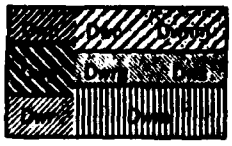
LEGEND

CANADAWAY GROUP
800-1200 ft. (240-370 m.)

Dcy — Machias Formation—shale, siltstone; Rushford Sandstone; Caneadea, Canisteo, and Hume Shales; Canaseraga Sandstone; South Wales and Dunkirk Shales; In Pennsylvania: Towanda Formation—shale, sandstone.

JAVA GROUP
300-700 ft. (90-210 m.)

Dj — Wiscoy Formation—sandstone, shale; Hanover and Pipe Creek Shales.



WEST FALLS GROUP
1100-1600 ft. (340-490 m.)

Dwn — Nunda Formation—sandstone, shale.

Dwg — West Hill and Gardeau Formations—shale, siltstone; Roricks Glen Shale; upper Beers Hill Shale; Grimes Siltstone.

Dwr — lower Beers Hill Shale; Dunn Hill, Millport, and Moreland Shales.

Dwc — Nunda Formation—sandstone, shale; West Hill Formation—shale, siltstone; Corning Shale.

Dwnm — "New Milford" Formation—sandstone, shale.

Dwrg — Gardeau Formation—shale,. siltstone; Roricks Glen Shale.

Dws — Slide Mountain Formation—sandstone, shale, conglomerate.

Dwm — Beers Hill Shale; Grimes Siltstone; Dunn Hill, Millport, and Moreland Shales

SONYEA GROUP
200-1000 ft. (60-300 m.)

Ds — In west: Cashaqua and Middlesex Shales.
In east: Rye Point Shale; Rock Stream ("Enfield") Siltstone; Pulteney, Sawmill Creek, Johns Creek, and Montour Shales.

GENESEE GROUP AND TULLY LIMESTONE
200-1000 ft. (60-300 m.)

Dg — West River Shale; Genundewa Limestone; Penn Yan and Geneseo Shales; all except Geneseo replaced eastwardly by Ithaca Formation—shale, siltstone and Sherburne Siltstone.

Dgo — Oneonta Formation—shale, sandstone.

Dgu — Unadilla Formation—shale, siltstone.

Dt — Tully Limestone.

GEOLOGY MAP LEGEND

REFERENCE
GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED: 1970, SCALE: 1:250,000

D'APPOLONIA

10 1253 HERCULENE. A&B SMITH CO., PGH., PA LT1930-1078

APPENDIX G

REFERENCES

APPENDIX G

REFERENCES

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